UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/657,585	09/08/2000	Wen-Kuan Chen	EM/CHEN/5997	2683

7590 08/06/2004

Bacon & Thomas PLLC
4th Floor
625 Slaters Lane
Alexandria, VA 22314-1176

EXAMINER	
LAROSE, COLIN M	
ART UNIT	**PAPER NUMBER**
2623	6

DATE MAILED: 08/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/657,585	CHEN, WEN-KUAN	
	Examiner	Art Unit	
	Colin M. LaRose	2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2004 and 19 May 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 5-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5 and 7-13* is/are rejected.

7)☒ Claim(s) *6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Arguments and Amendments

1. Applicant's amendments filed 19 May 2004 and arguments filed 23 April 2004, have been entered and made of record.

Response to Amendments and Arguments

2. By way of amendment, Applicant has incorporated the subject matter of claims 3 and 4 into claim 1 and has canceled claims 3 and 4. Applicant argues (see paper 3, pages 5-6) that Ng does not disclose the features of claim 4, which are now present in claim 1. However, the Examiner disagrees and provides reasoning below in paragraph 3.

As a result of the amendment, the previous rejection of claims 1 and 2 in paragraph 7 of paper 2 has been withdrawn because neither Agarwal nor Hsu appear to teach or suggest the frame data being represented by multiple macroblocks after being decoded, and then storing the macroblocks in the frame buffer and temporary buffer, as claimed. However, a new ground of rejection is presented below.

As a result of the amendment, the previous claims objections (paragraph 1, paper 2) and claim rejections under 35 USC 112 (paragraph 3, paper 2) have been withdrawn.

3. Regarding claim 1, Applicant argues (see paper 3, pages 5-6) that Ng does not disclose the features of:

"the frame buffer only stores a portion of the macroblock lines corresponding to the frame data of the still picture, and the temporary buffer stores at least one other macroblock line."

Applicant argues that Ng stores fields rather than macroblock lines in the frame and temporary buffers (paper 3, page 6).

It is true that Ng's frame buffer (316) and temporary buffer (314) store even and odd fields, respectively (or vice versa). However, Ng's system operates in the MPEG environment, wherein the coding and decoding operations are executed on image blocks, known as macroblocks. As shown in figure 6, each field is composed of slices, and each slice is composed of macroblocks.

Therefore, when Ng refers to storing an even or odd field in a buffer, the stored field is comprised of lines macroblocks, or slices. In compressed form, the macroblocks are composed of DCT coefficients, and in the decompressed form, the macroblocks are composed of pixel values or their residues (see coumn 11, lines 24-58).

4. Regarding claim 8, Applicant argues (see paper 3, page 8) that Schoner teaches reading and re-reading in a line, rather than in a cycle. However, it is clear from Schoner's disclosure that his pointers effect cyclical repetition of read operations. For example, in column 5, lines 62-64, Schoner discloses that the read pointers are used to "loop" through the FIFO buffer to repeatedly re-scan the image.

Claim Objections

5. Claim 5 is objected to because of the following informalities: it depends from a canceled claim. For examination purposes, claim 5 is presumed to depend from claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 5, 7, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,146,325 by Ng.

Regarding claim 1, Ng discloses a high-resolution picture decoding device (figure 4), comprising:

a memory device (e.g. figure 5) having, *inter alia*, a bit-stream buffer (300, figure 5), a temporary buffer (47 or, equivalently, 314, figure 5), and a frame buffer (48, or equivalently, 316, figure 5), the bit-stream buffer being adapted to store bit-stream data from a storage media (the video data received by the bit-stream buffer 300 is stored in buffers 18 & 19 (figure 2) prior to transmission to the decoding device of figure 4); and

a decoding means (decompress 45 & 46, which are shown in more detail in figure 5 as elements 302-312) for decoding the bit-stream data in the bit-stream buffer and storing decoded frame data in the frame buffer or the temporary buffer, such that, when a still picture is to be

displayed, the frame buffer stores part of the frame data corresponding to the still picture (the frame buffer 316 stores e.g. the even field) and the temporary buffer is provided to store the other frame data (the temporary buffer 314 stores e.g. the odd field) which is decoded in real time as the still picture is displayed (i.e. the data in both buffers has been decoded for real-time image display), and the data in the frame buffer and temporary buffer is output for displaying a high-resolution still picture (i.e. data from buffers 314 & 316 is output to video RAM 318 for display),

wherein the frame data in the bit-stream buffer is represented by multiple macroblock lines after being decoded (column 3, lines 28-32: the video data is in MPEG format, which is represented by macroblocks), the frame buffer only stores part of the macroblock line corresponding to the frame data of the still picture (i.e. the frame buffer 316 only stores half of the macroblock lines of the still picture), and the temporary buffer has a memory space for storing at least one macroblock line (i.e. the temporary buffer 314 stores half of the frame of the still picture, so it can store at least one line of macroblocks).

Regarding claim 5, Ng discloses the frame buffer 316 stores even numbered macroblock lines corresponding to the frame data of the picture (column 10, lines 31-35: each buffer 314 & 316 stores either the even or odd field).

Regarding claim 7, Ng discloses for a field of displaying still picture and in a time point of switching to display the still picture, the bit-stream of a frame from the bit-stream buffer is processed by a first decoding process in one field display time of a top filed [sic] to decode the even numbered macroblock lines, and the decoded frame data is stored in the frame buffer (i.e. the even and odd field are independently decoded; therefore, the even-field data is decoded by a

first process – by decompress block 46 of figure 4 – that decodes the even field of the frame during the display of the odd field, and then the decoded even field is stored in the frame buffer 316),

while in one field display time of the other fields, the bit-stream of a frame from the bit-stream is processed by a second decoding process to decode the odd numbered macroblock lines (i.e. the odd field is decoded by decompress block 45 of figure 4).

Regarding claim 13, Ng discloses a multiplexer (320) which select data in the frame buffer or the temporary buffer to output.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,141,385 by Yamaji in view of U.S. Patent 5,790,138 by Hsu.

Regarding claim 1, Yamaji discloses a high-resolution picture decoding device (figure 1), comprising:

a memory device having a bit-stream buffer (6) and a frame buffer (90), the bit-stream buffer being adapted to store bit-stream data from a storage media; and

a decoding means (8) for decoding the bit-stream data in the bit-stream buffer and storing decoded frame data in the frame buffer, such that, when a still picture is to be displayed, the

frame buffer stores part of the frame data corresponding to the still picture which is decoded in real time as the still picture is displayed (i.e. the data in the frame buffer 9 stores at least a part of the decoded frame data), and the data in the frame buffer is output for displaying a high-resolution still picture (i.e. data from the frame buffer is output for display),

wherein the frame data in the bit-stream buffer is represented by multiple macroblock lines after being decoded by the decoding means (i.e. the video data is in MPEG format, which is represented by macroblocks).

Yamaji does not disclose the claimed temporary buffer. Also, Yamaji does not disclose that the frame buffer stores only a portion of the macroblock lines, and that a temporary buffer stores at least one other macroblock line.

Hsu discloses an improved memory architecture for displaying high-resolution images (figure 3). In particular, Hsu discloses the use of an expansion frame buffer 306, which functions as an auxiliary buffer when the capacity of the frame buffer 304b is insufficient for storing a high-resolution image (column 2, lines 43-64). The expansion buffer 306 essentially provides additional storage capacity with minimal additional circuitry and stores those parts of the image frame that do not fit in the regular frame buffer 304b.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Yamaji by Hsu to include Hsu's expansion buffer 304b as the claimed "temporary buffer" in Yamaji's image codec/display system, since Hsu teaches that the inclusion of an auxiliary temporary buffer provides extra storage capacity and supports the real-time display of

high-resolution images (column 2, lines 43-64). By coupling Hsu's expansion buffer to Yamaji's frame buffer (90), Yamaji's frame buffer would be operative to store only a portion of the macroblock lines of an oversized high-resolution image, and the expansion buffer would be operative to store any remaining macroblock lines that do not fit into the frame buffer.

Regarding claim 2, Hsu discloses the temporary buffer has a memory space less than that of the frame buffer (column 3, lines 6-11: the expansion memory is half or less the total frame buffer).

10. Claims 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ng in view of U.S. Patent 5,903,282 by Schoner et al. ("Schoner").

Regarding claim 8, Ng discloses the second decoding process is repeatedly executed (i.e. it is repeatedly executed for an entire still picture). Ng is silent to there being two pointers for setting a picture range in which read operations of bit-stream data can be cyclically repeated.

Schoner discloses a video decoder dynamic memory allocation system for use with an MPEG codec. In order to reduce memory requirements of an MPEG decoder, Schoner discloses "freezing" a displayed image. Freezing the image involves fixing two pointers, L and C, on the first memory segment pointer of the image field for the luma and chroma parameters. During an operation where the image is read from the bit-stream buffer, the pointers, FC and FL, are used for reading the image. Once FC and FL read an end-of-field designation, they are redirected to the frozen L and C pointers, and the image is re-read. See column 12, line 60 through column 13, line 26. Thus, in the frozen state, two pointers are utilized for designating a range in which read operations of bit-stream data are cyclically repeated.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ng by Schoner to achive the claimed invention since Schoner teaches that providing two pointers for setting a picture range in which read operations of bit-stream data can be cyclically repeated helps reduce memory requirements in an MPEG environment (column 5, lines 28-42).

Regarding claim 9, Ng discloses the decoding means has an image decoder which comprises a variable-length decoder, run-length decoder, inverse quantizer, and an inverse discrete cosine transform unit, and data read out from the bit-stream buffer is processed by the VLD, RLD, IQ and IDCT sequentially for being stored in frame buffer or temporary buffer (column 11, lines 2-12).

Regarding claim 10, Ng's variable-length decoder performs run-length decoding, which eliminates unnecessary lines of macroblocks.

Regarding claim 11, Ng discloses a DC predictor (304, figure 5) for preserving DC component of the bit-stream data processed by the VLD.

Regarding claim 12, Ng discloses only data of one field is determined by the IDCT for being stored into the temporary buffer (i.e. the temporary buffer only stores on field of image data processed by the IDCT block).

Allowable Subject Matter

11. Claim 6 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colin M. LaRose whose telephone number is (703) 306-3489. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached on (703) 308-6604. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the TC 2600 Customer Service Office whose telephone number is (703) 306-0377.

CML

Group Art Unit 2623

28 July 2004